

Conclusions DM supplement to MM supports growth in VLBWI without adversely affecting LowNa or NumNa.

Table 1: Univariate comparisons of VLBW infants receiving any donor human milk (DM+) and no donor milk (DM-). The two groups did not differ with respect to lowest serum Na, number of serum Na samples, or weight gain.

	DM+	DM-	P*
Lowest serum Na between birth and 56 days, mEq/L	134 (129, 135)	131.5 (128, 135)	0.509
Number of serum Na samples between birth and 56 days	15 (9, 33)	20.5 (11, 37)	0.363
Weight gain at 28 days, grams/kg BWt	239 (230, 409)	292 (230, 395)	0.193
Weight gain at 56 days, grams/kg BWt	1034 (931, 1190)	1048 (893, 1209)	0.368

*Mann-Whitney U test.

Data given as median, (25th, 75th percentile). BWt: birth weight

Table 2: Multivariate linear mixed model examining lowest serum Na between birth and 56 days of age in VLBW infants. Each 100 ml of donor milk intake was associated with a 0.12 mEq/L reduction in lowest serum Na after adjusting for age, prematurity, illness severity, and overall nutritional intake.

	Lowest serum Na, mEq/L	95% CI	P
Adjusted mean at 28 days, mEq/L	136	129, 143	<0.001
Day 35, compared with day 28	-0.18	-1.55, 1.20	0.799
Day 42, compared with day 28	1.14	-0.28, 2.56	0.113
Day 49, compared with day 28	1.13	-0.27, 2.53	0.112
Day 56, compared with day 28	1.46	0.08, 2.83	0.038
GA, per week	0.07	-0.33, 0.47	0.731
BWt, per 100 grams	0.02	-0.01, 0.05	0.268
Days on mechanical ventilator or CPAP in 1st 28 days, per day	-0.09	-0.19, 0.01	0.057
Donor milk intake in 1st 28 days, per 100 ml	-0.12	-0.21, -0.03	0.007
Total enteral intake, 1st 28 days, per 100 ml	-0.01	-0.13, 0.11	0.831
Days parenteral nutrition in 1st 28 days, per day	-0.03	-0.24, 0.17	0.745

BWt: birth weight; GA: gestational age

1398 EFFECT OF FORTIFIERS AND ADDITIONAL PROTEIN ON THE OSMOLARITY OF HUMAN MILK- IS IT SAFE FOR THE PREMATURE INFANT?

doi:10.1136/archdischild-2012-302724.1398

N Haiden, A Kreissl, V Zwiauer, A Repa, C Binder, N Haninger, A Berger. *Department of Pediatrics, Medical University of Vienna, Vienna, Austria*

Background and Aims A new additional protein supplement (Aptamil Protein+®/Milupa) was developed to meet special protein requirements of infants with a birthweight below 1000g (4.0–4.5 g protein/kg/day). So far it was unknown, how this new protein supplement influences osmolality, which is known to be a risk factor for necrotising enterocolitis (NEC). The aim of this study was to evaluate the effects of fortification on the osmolality of human milk (HM).

Methods Osmolality of breast milk was measured in native HM, in HM+ HMF (human milk fortifier; Aptamil FMS 4.3%®, Milupa) and in HM+ HMF+ Protein+ gaining in 0.5 g steps up to 4 g. Measurements were performed immediately after adding on fortifier and/or protein and after 24 hours. In addition, changes in osmolality after adding therapeutic additives like iron (Ferrum Hausmann®, Vifor), multivitamin supplement (Protovit®, Bayer) and calcium-phosphorus capsules were measured.

Results Osmolality of native human milk (n=84) was 297mosm/l, (=Median, Range 278–348). Adding HMF increased osmolality up to 436mosm/l (=Median; Range 386–486). Additional Protein+ supplementation increased osmolality by 23.5mosm/l (Median) per 0.5g step, up to a maximum of 605 mosm/l (+4g). Osmolality of HM/fortifier/Protein+ mixes remained stable for 24 hours. Multivitamin supplements increased osmolality up to 842mosm/l.

Discussion Additional Protein+ increased osmolality of HM up to a critical cut off point (>400mosmol) and therefore might be a risk factor for developing NEC. Additional fortification of HM +HMF

with Protein+ should not be applied together with multivitamins or other additives.

1399 NUTRITION OF THE EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS: ARE WE MAKING A DIFFERENCE?

doi:10.1136/archdischild-2012-302724.1399

R Snyder, S Allykas, A Mennonna, MR Rogido. *Goryeb Hospital/MANA, Morristown, NJ, USA*

Background Adequate nutrition of ELBW infants is difficult to achieve, yet crucial for their survival and neurodevelopment. Awareness of the problem and consistency in the care provided is a necessary step for improving outcome.

Aim To evaluate the impact of recently instituted nutritional guidelines in ELBW in our NICU.

Methods Our NICU instituted nutritional guidelines in July 2008 after exhaustive review and discussion of best available evidence. Recommendations included early introduction of trophic enteral feeding (TF), timing and rate for advancing enteral feeds and criteria for its discontinuation, among others. We performed a retrospective review of charts in all ELBW admitted between January 2007 and December 2010. Demographic information, time to introduction of TF, age at which feedings were advanced and full feed were achieved, days on Total Parenteral Nutrition (TPN) and days of Percutaneously Inserted Central Catheters (PICC), growth parameters and outcome were analyzed and compared for ELBW population before (Period 1) and after (Period 2) the institution of nutritional guidelines.

Results

Abstract 1399 Table 1 Comparison between Period 1 and Period 2

	Period 1 (n=83)	Period 2 (n=103)
TF at 48 hs (%)	37	39
Enteral feeds > 20 ml/kg by DOL 7 (%)	42	60 *
Full feeds at DOL 28 (%)	41	80 *
Days on TPN (mean±SE)	32±3.8	22.7±2.4 *
PICC days (mean±SE)	32.7±4.2	21.4±2.5 *
NEC Stage 2 (%)	12.7	13

*p<0.05; #p<0.02.

Conclusions The institution of nutritional guidelines resulted in significant improvement in nutritional indicators in our population.

1400 BODY FAT IN VLBW IS INFLUENCED BY DURATION OF TOTAL PARENTERAL NUTRITION (TPN)

doi:10.1136/archdischild-2012-302724.1400

R Snyder, S McDonough, J Ladino, K Crowley. *Pediatrics, Goryeb Childrens Hospital, Morristown, NJ, USA*

Background Adequate postnatal nutrition and growth are essential for optimal neurodevelopment in VLBW infants. In an effort to optimize nutrition, early TPN implementation is recommended while enteral nutrition is achieved. However, excessive caloric intake could result in disproportionate accretion of body fat leading to metabolic syndrome later in life.

Aim To identify the influence of early postnatal nutrition on body fat composition in VLBW infants.

Design/methods We included all infants admitted to our NICU from July 30, 2011 to December 31, 2011 with a birth weight ≤ 1500 grams that survived at least 4 weeks and received TPN. We excluded infants with major congenital anomalies. Body composition was measured weekly using an air displacement plethysmograph (PeaPod, CosMed).

Results Twenty two infants met inclusion criteria. Over 90 measurements were obtained. TPN days ranged from 5 to 39 days. Seventeen infants (77%) received TPN for less than 21 days of TPN. Their mean percent of body fat was 10.9%, significantly lower than the 22% measured in those babies on ≥ 21 days on TPN.

Conclusion In our population of VLBW, those who received TPN for longer than 3 weeks have a significant increase in body fat composition. This could result in increased risk for metabolic syndrome in early adulthood in this population. Our eagerness to avoid postnatal malnutrition could lead to an iatrogenic neonatal origin of adult disease. We are currently analyzing potential confounders and the TPN composition associated with these findings.

1401 COMPUTER AIDED NUTRITION - EFFECTS ON GROWTH IN PRETERM INFANTS GA< 32 WEEKS

doi:10.1136/archdischild-2012-302724.1401

^{1,2}D Wackernagel, ^{1,3}A Brückner, ⁴F Ahlsson. ¹Department of Paediatrics, Mälarsjukhuset, Eskilstuna; ²Astrid Lindgren's Children Hospital, Karolinska University and Karolinska Institutet, Stockholm, Sweden; ³Department of Neonatology and Pediatric Intensive Care, Asklepios Childrenshospital St. Augustin, St. Augustin, Germany; ⁴Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden

Background and Aims Preterm infants (PI) are often discharged from the NICU with suboptimal growth. It seems obvious that a commercial nutrition calculating program (NCP) could help to compute macro- and micro nutrients more easily. The aim of this intervention study was to determine whether a NCP could optimise the growth of PI.

Methods In 78 PI (GA \leq 32+0) cases grouped in 35 PI before (CG) and 43 after (IG) the implementation of the NCP Nutrium weight, length and head circumference at birth, day 28, GA 36 and discharge were compared.

Additionally daily intake of total fluid, energy, carbohydrate (CH), aminoacids (AA), fatty acids (FA), Na, K, Ca, Mg, P, Fe, Zn and vitamins A, E and D in postnatal weeks 1–7 were recorded and compared.

Results

AA, CH, Ca, P, Zn intake was significantly increased. FA and total energy was marginally increased in week 1. Vitamin A, E and D intake was optimised in IG and tended to be overdosed in CG (Recommendations based on Tsang/ESPGHAN).

Conclusion By using the NCP growth overall and especially length-growth was significantly optimised in PI (GA \leq 32+0) through optimising intake of CH, AA, Ca, P, Zn. In the IG it was more likely that Vitamins were dosed correctly.

1402 CHANGES ON PARENTERAL NUTRITION FOR VERY PRETERM BABIES DURING THE FIRST WEEK AND THEIR EFFECT ON GROWTH DURING ADMISSION

doi:10.1136/archdischild-2012-302724.1402

¹I Iglesias-Platas, ¹M Izquierdo-Renau, ¹R del Río, ²P González-Carretero, ³N Pociello, ¹X Krauel. ¹Neonatal Unit, Hospital Sant Joan de Déu, Barcelona; ²Neonatal

Unit, Hospital Nuestra Señora de la Candelaria, Santa Cruz de Tenerife; ³Neonatal Unit, Hospital Arnau de Vilanova, Lleida, Spain

Current nutritional recommendations for very low birthweight infants (VLBWI) focus on avoiding catabolism and supporting growth. We aimed to assess the results of a change in the parenteral nutrition protocol for VLBWI in our unit on the nutritional support received by these patients during the first week of life and the growth rates achieved.

Patients Infants < 1500g admitted to our unit one year before and one year after the change (periods I and II).

Method Revision of clinical charts and retrieval of data regarding nutritional intakes, growth and clinical outcomes.

Results 136 infants were studied (76 on period A and 60 on period B). There were no significant differences in baseline characteristics: gestational age (28.8 \pm 2.1 vs 29.0 \pm 2.0 weeks), birthweight (1.103 \pm 222 vs 1.091 \pm 214 g), gender distribution, perinatal characteristics and initial severity of illness. Parenteral nutrient supply was consistently higher throughout the first week in VLBWI in period II. There were no changes in enteral or total fluid supply.

The percentage of body weight loss was significantly lower in period B (11.3 \pm 4.9% vs 7.3 \pm 5.2%) and the recovery of birth weight was quicker (2 weeks vs 10 days, $p<0.0001$). The daily increase in weight was also significantly higher in the group with optimized nutrition, both from birth to day 14 of life and from day 14 to discharge.

Conclusions Extrauterine growth restriction is a prevalent complication of very preterm birth. Optimization of parenteral nutritional strategies in our neonatal unit had a positive effect in growth of this population during admission.

1403 DOES AMNIOTICFLUID PLAY A NUTRITIVE ROLE BEFORE BIRTH? A RETROSPECTIVE ANALYSIS OF NEWBORNINFANTS WITH UPPER AND LOWER GASTROINTESTINAL ATRESIA

doi:10.1136/archdischild-2012-302724.1403

¹H Zillhardt, ²J Korczyk, ²A Heydweiller, ^{3,4}H Reutter, ¹A Müller, ¹P Bartmann, ¹S Bagci. ¹Department of Neonatology, Children's Hospital; ²Department of Pediatric Surgery, University of Bonn; ³Department of Neonatology, Children's Hospital, University of Bonn; ⁴Institute of Human Genetics, University of Bonn, Bonn, Germany

Introduction During pregnancy the fetus swallows and absorbs an increasing amount of amniotic fluid. It remains unclear whether a lack of absorption of amniotic fluid may result in low birth weight (BW). There are a few studies evaluating the significance of amniotic fluid on fetal growth and the their results are controversial. This study was carried out to evaluate the intrauterine nutritive role of amniotic fluid on fetal growth.

Method Neonates with atresia of gastrointestinal tract (GIT) during a period of 12 years were studied retrospectively. 29 from 100 patients were excluded from the statistical analysis because of VATER (VACTERL) association (8), chromosomal abnormalities (11) and congenital heart anomalies (10). BW and birth length (BL)

Abstract 1401 Table 1 Postnatal growth CG vs IG

	group	Birth (mean \pm SD)	p	Day 28 (mean \pm SD)	p	GA36 (mean \pm SD)	p	Discharge (mean \pm SD)	p
Weight-SDS	CG	-1.4 \pm 1.7	n.s.	-2.6 \pm 1.7	0.03	-2.3 \pm 1.5	<0.05	-1.9 \pm 1.1	<0.05
	IG	-1.0 \pm 1.5		-1.9 \pm 1.4		-1.4 \pm 1.2		-1.0 \pm 1.1	
Length-SDS	CG	-1.8 \pm 2.0	n.s.	-3.0 \pm 1.6	0.02	-3.2 \pm 1.8	<0.05	-2.7 \pm 1.8	<0.05
	IG	-1.2 \pm 1.9		-2.0 \pm 1.9		-1.7 \pm 1.7		-1.2 \pm 1.3	
Headcircum.-SDS	CG	-0.4 \pm 1.3	n.s.	-1.5 \pm 1.1	0.04	-1.1 \pm 0.9	0.05	-0.4 \pm 0.8	0.03
	IG	-0.5 \pm 1.1		-0.9 \pm 1.2		-0.6 \pm 1.2		+0.1 \pm 1.0	